

We claim:

1. A linear epitope for a human autoantibody selected from the group of peptides of less than forty amino acids, beginning with the amino acid numbered from the amino terminus followed by the listed amino acid sequence consisting of

the Ia/SSB epitopes: 136, QVLNIQMRRTLHKAFKGS, 139, NIQMRRTLHKAFK, 144, RTLHKAFK, 17, ICHQIEYYFGDFNLPRDKFLK, 24, YFGDFNLP, 46, WVPLEIMIKFNR, 47, VPLEIMIK, 86, KKTKIRRSPSKPL, 89, KIRRSPSK, 56, NRLNRLTTDFNVIVE, 56, NRLNRLTT, 257, GEIKWIDFVRGAK, 260, KWIDFVRGAK, 262, IDFVRGAK, 325, SLNKWWSKGRRFKKGKGNK, 330, KSKGRRFK, 292, GNLQLRNKEVTW, 296, LRNKEVTW, 154, IFVVFDSE, 155, FVVFDSE, 176, KETDLLILFKDDYFA, 182, ILFKDDYF, 104, YKNDVKNRSVYIKGFPT, 112, SVYIKGFP, 63, TDFNVIVE, 64, DFNVIVEA, 270, EGIILFKEKAK, 270, EGIILFKE, 354, KVQFQGKTKFASD, 360, KKTKFASD, 246, REDLHILF, 232, CLLKFSGD, 379, TGPVKRAR, 200, KVEAKLRAKQ, 202, EAKLRAKQ;

the Ro/SSA epitopes: 30, MNRLHRFL, 37, LCFGSEG GT, 38, CFGSEG GT, 44, SEG GTYYIKEQ, 45, EGGTYIYIKEQ, 47, GTYYIKEQ, 47, GTYYI, 76, EIKSFSQEGRT, 78, KSFSQEGR, 81, SQEGRTTKQ, 84, GRTTKQEPM, 105, STKQAAFKAV, 106, ISTKQAAFKAVS, 109, KQAAFKAV, 111, AFKAVSEVC, 126, FTFIQFKDLKESMK, 130, QFKKDLKE, 138, SMKCGMWGRA, 139, MKCGMWGRA, 142, GMWGRALRKAIA, 145, GRALRKAI, 165, ALAVTKYKORNGWSHKDLLRLSH, 169, TKYKORNG, 173, ORNGWSHK, 182, LLRLSHLKPSS, 184, RLSHLKPS, 198, TKYITKGW, 201, ITKGWKEV, 210, HELYKEKA, 212, LYKEKALSV, 215, KALSVETEKLLKYL, 221, TEKLLKYL, 224, KLLKYLEA, 229, LEAVEKVKRTKDE, 234, KVKRTKDE, 257, HLLTNHLKSKEVWKALLQEMPL, 263, LKSKEVWK, 264, KSKEVWKA, 265, SKEVWK, 280, ALLRNLGKMTA, 283, RNLGKMT, 285, LGKMTANS, 308, LCNEKLLKKARIHPFHI, 313, LLKKARI, 315, KKARIHPF, 330, TYKTGHGLRGKLKWRPDE, 331, YKTGHGL, 352, ALDAAFYK, 355, AAFYKTFKTVEPTGKRFLLA, 362, ASMNORVLGS, 365, EPTGKRFL, 398, AMCMVVTR, 414, AFSDEMVP, 420, VPCPVTTD, 433, VLMAMSQI, 445, TDCSLPMI, 449, LPMIWAQKTNTPA, 453, TFAGGVHPAI, 472, TFAGGVHPAI, 472, TFAGGVHP, 482, IALREYRKKMDIPAKL, 484, REYRKKMD;

the Sm B/B' epitopes: 20, IGTFKAFD, 21, GTFKAFDK, 22, TFKAFDKH, 29, GTFKAFDK, 30, TFKAFDKHM, 44, DCDEFKRI, 45, CDEFKRIK, 45, CDEFKRIKPKNAKQP, 46, DEFKJKP, 47, EFRKIKPK, 76, FRKJKPKN, 77, RKIKPKNA, 78, KIKPKNAK, 79, IKPKNAKQ, 80, KPKNAKOP, 81, PKNAKQPE, 83, EGPPPKDT, 88, KDTGIARV, 94, RVPLAGAA, 101, AGGPGVGRAAGRGVPAG, 104, PGVGRAAG, 120, IPQAPAGLAG, 125, AGLAGPVRGVGGPSQ, 131, VRGVGGPS, 139, QQVMTPOG, 140, QVMTPOGR, 141, VMTPOGRG, 144, POGR, 142, MTPQGBGT, 143, TPQGRGTV, 144, PQGRGTVA, 145, QGRGTVA, 164, APTQYPPG, 165, PTQYPPGR, 166, TQYPPGRG, 167, QYPPGRGT, 168, YPPGRGTP, 169, PPGRGTTP, 170, PGRGTTPP, 171, GRGTTPPP, 172, RGTTPPPV, 173, GTPPPPVG, 174, TTPPPVGRATPPPGI, 175, PPPVGRA, 184, PPPGIMAP, 188, IMAPPPGM, 189, MAPPPGMRPPM, 189, MAPPPGMR, 191, PPPGMR, 190, APPPGMRP, 191, PPPGMRPP, 192, PPGMRPPM, 202, PIGLPPARGTPIGMPP, 206, PPARGTPI, 212, PIGMPPPG, 213, IGMPPPGM, 214, GMPPPGMB, 216, PPPGMB, 215, MPPPGMRP, 216, PPPGMRPP, 217, PPGMRPPP, 220, MRPPPPGI, 221, RPPPPGIR, 221, RPPPPGIRGPP, 223, PPPGIR, 222, PPPPGIRG, 223, PPPGIRGP, 224, PPGIRGPP, 228, RGPPPPGM, 228, RGPPPPGMRPPR, 229, GPPPPGMR, 230, PPPPGMRP, 231, PPPGMRPP, 231, PPPGMR, and 232, PPGMRPPR.

2. The epitope of claim 1 consisting of between four and twenty five amino acids.

3. The epitope of claim 2 reactive with anti-Ro/SSA polyclonal antibodies.

4. The epitope of claim 2 reactive with anti-SM B/B' polyclonal antibodies.

5. The epitope of claim 2 reactive with anti-La/SSB polyclonal antibodies.

6. The epitope of claim 1 wherein the peptide is selected from the group consisting of 29, GTFKAFDK, 45, CDEFKRIKPKNAKQP, 94, RVPLAGAA, 101, AGGPGVGRAAGRGVPAG, 125, AGLAGPVRGVGGPSQ, 140, QVMTPOGRGTVA, 165, PTQYPPGRGTTPPPV, 174, TTPPPVGRATPPPGI, 184, PPPGIMAP, 189, MAPPPGMRPPM, 202, PIGLPPARGTPIGMPP, 212, PIGMPPPG, 221, RPPPPGIRGPP, and 228,

Sub 192
RGPPPPGMRPPR, 30, TFKAFDKHM, 83, EGPPPKDT, 88, KDTGIARV, and 120, IPQAPAGLAG, or mixtures thereof.

7. The epitopes of claim 1 in combination with a pharmaceutical carrier for administration to a patient.

Sub 1
8. The epitopes of claim 7 in an effective concentration for administration to a patient to neutralize circulating autoantibody.

Sub 197
9. The epitopes of claim 7 further comprising a pharmaceutical carrier for administration to a patient, wherein the carrier and concentration of sequences elicit an immune response when administered to a host.

Sub 147
10. The epitopes of claim 1 labelled with a compound selected from the group consisting of dyes, fluorescent labels, chemiluminescent labels, enzymes, and radioactive labels.

11. The epitopes of claim 1 immobilized onto a substrate.

12. A method for screening patients for autoimmune disorders comprising reacting a biological sample with an epitope selected from the group of peptides of less than forty amino acids, beginning with the amino acid numbered from the amino terminus followed by the listed amino acid sequence consisting of

Sub 193
the La/SSB epitopes: 136, QVLNIQMRRTLHKAFKGS, 139, NIQMRRTLHKAFK, 144, RTLHKAFK, 17, ICHQIEYYFGDFNLPRDKFLK, 24, YFGDFNLP, 46, WVPLEIMIKFNR, 47, VPLEIMIK, 86, KKT KIRRSPPSKPL, 89, KIRRSPPSK, 56, NRLNRLTTDFNVIVE, 56, NRLNRLTT, 257, GEIKWIDFVRGAK, 260, KWIDFVRGAK, 262, IDFVRGAK, 325, SLNKWKSKGRRFKGKGKGNK, 330, KSKGRRFK, 292, GNLQLRNKEVTW, 296, LRNKEVTW, 154, IFVVFDSE, 155, FVVFDSE, 176, KETDLLILFKDDYFA, 182, ILFKDDYF, 104, YKNDVKNRSVYIKGFPT, 112, SVYIKGFPT, 63, TDFNVIVE, 64, DFNVIVEA, 270, EGIILFKEKAK, 270, EGIILFKE, 354, KVQFQGKTKFASD, 360, KKT K FASD, 246, REDLHILF, 232, CLLKFSGD, 379, TGPVKRAR, 200, KVEAKLRAKQ, 202, EAKLRAKQ;

the Ro/SSA epitopes: 30, MNRLHRFL, 37, LCFGSEGGT, 38, CFGSEGGT, 44, SEGPTYIIEQ, 45, EGPTYIIEQ, 47, GPTYIIEQ, 47, GPTYI, 76, EIKSFSQEGRT, 78, KSFSQEGRT, 81, SQEGRTTKQ, 84,

GRTTKQEPN, 105, STKQAAFKAV, 106, ISTKQAAFKAVS, 109, KQAAFKAV, 111, AFKAVSEVC, 126, FTFIQFKDLKESMK, 130, QFKKDLKE, 138, SMKCGMWGRA, 139, MKCGMWGRA, 142, GMWGRALRKAIA, 145, GRALRKAI, 165, ALAVTKYKORNGWSHKDLLRLSH, 169, TKYKORNG, 173, ORNGWSHK, 182, LLRLSHLKPSS, 184, RLSHLKPS, 198, TKYITKGW, 201, ITKGWKEV, 210, HELYKEKA, 212, LYKEKALSV, 215, KALSVETEKLLKYL, 221, TEKLLKYL, 224, KLLKYLEA, 229, LEAVEKVKRTKDE, 234, KVKRTKDE, 257, HLLTNHLKSKEVWKALLOEMPL, 263, LKSKEVWK, 264, KSKEVWKA, 265, SKEVWK, 280, ALLRNLGKMTA, 283, RNLGKMT, 285, LGKMTANS, 308, LCNEKLLKKARIHPFHI, 313, LLKKARI, 315, KKARIHPF, 330, TYKTGHGLRGKCLKWRPDE, 331, YKTGHGL, 352, ALDAAFYK, 355, AAFYKTFKTVEPTGKRFLLA, 362, ASMNORVLGS, 365, EPTGKRFL, 398, AMCMVVTR, 414, AFSDEMVP, 420, VPCPVTTD, 433, VLMAMSQI, 445, TDCSLPMI, 449, LPMIWAQKTNTPA, 453, TFAGGVHPAI, 472, TFAGGVHPAI, 472, TFAGGVHP, 482, IALREYRKKMDIPAKL, 484, REYRKKMD;

the Sm B/B' epitopes: 20, IGTFKAFD, 21, GTFKAFDK, 22, TFKAFDKH, 29, GTFKAFDK, 30, TFKAFDKHM, 44, DCDEFKRI, 45, CDEFKAIK, 45, CDEFKIKPKNAKQP, 46, DEFRKJKP, 47, EFRKIKPK, 76, FRKJKPKN, 77, RKIKPKNA, 78, KIKPKNAK, 79, IKPKNAKQ, 80, KPKNAKOP, 81, PKNAKQPE, 83, EGPPPKDT, 88, KDTGIARV, 94, RVPLAGAA, 101, AGGPGVGRAAGRGVPAG, 104, PGVGRAAG, 120, IPQAPAGLAG, 125, AGLAGPVRGVGGPSQ, 131, VRGVGGPS, 139, QQVMTPQG, 140, QVMTPQGR, 141, VMTPOGRG, 144, POGR, 142, MTRQGBGT, 143, TPQGRGTV, 144, PQGRGTVA, 145, QGRGTVAA, 164, APTQYPPG, 165, PTQYPPGR, 166, TQYPPGRG, 167, QYPPGRGT, 168, YPPGRGTP, 169, PPGRGTTP, 170, PGRGTPPP, 171, GRGTPPPP, 172, RGTPPPPV, 173, GTPPPPVG, 174, TPPPPVGRATPPPGI, 175, PPPVGRA, 184, PPGIMAP, 188, IMAPPPGM, 189, MAPPPGMRPPM, 189, MAPPPGMR, 191, PPPGMR, 190, APPPGMRP, 191, PPPGMRPP, 192, PPGMRPPM, 202, PIGLPPARGTPIGMPP, 206, PPARGTPI, 212, PIGMPPPG, 213, IGMPPPGM, 214, GMPPPGMB, 216, PPPGMB, 215, MPPPGMRP, 216, PPPGMRPP, 217, PPGMRPPP, 220, MRPPPPGI, 221, RPPPPGIR, 221, RPPPPGIRGPP, 223, PPPGIR, 222, PPPPGIRG, 223, PPPGIRGP, 224, PPGIRGPP, 228, RGPPPPGM, 228, RGPPPPGMRPPR, 229, GPPPPGMR, 230, PPPPGMRP, 231, PPPGMRPP, 231, PPPGMR, and 232, PPGMRPPR, or mixtures thereof.

21
cont
13. The method of claim 12 wherein the epitopes are labelled with a compound selected from the group consisting of dyes, fluorescent labels, chemiluminescent labels, enzymes, and radioactive labels.

14. The method of claim 12 wherein the peptides are immobilized onto a substrate.

15. The method of claim 14 further comprising detecting autoantibodies in the patient sample.

16. The method of claim 15 further comprising predicting the prognosis of the patient based on the reactivity of the patient sample with the epitopes.

17. A method for treating patients for autoimmune disorders comprising administering to the patient an epitope selected from the group of peptides of less than forty amino acids, beginning with the amino acid numbered from the amino terminus followed by the listed amino acid sequence consisting of

the La/SSB epitopes: 136, QVLNIQMRRTLHKAFKGS, 139, NIQMRRTLHKAFK, 144, RTLHKAFK, 17, ICHQIEYYFGDFNLPRDKFLK, 24, YFGDFNLP, 46, WVPLEIMIKFNR, 47, VPLEIMIK, 86, KKTKIRRSPSKPL, 89, KIRRSPSK, 56, NRLNRLTTDFNVIVE, 56, NRLNRLTT, 257, GEIKWIDFVRGAK, 260, KWIDFVRGAK, 262, IDFVRGAK, 325, SLNKWWSKGRRFKKGKGNK, 330, KSKGRRFK, 292, GNLQLRNKEVTW, 296, LRNKEVTW, 154, IFVVFDSE, 155, FVVFDSE, 176, KETDLLILFKDDYFA, 182, ILFKDDYF, 104, YKNDVKNRSVYIKGFPT, 112, SVYIKGFP, 63, TDFNVIVE, 64, DFNVIVEA, 270, EGIILFKEKAK, 270, EGIILFKE, 354, KVQFQGKTKFASD, 360, KKTKFASD, 246, REDLHILF, 232, CLLKFSGD, 379, TGPVKRAR, 200, KVEAKLRAKQ, 202, EAKLRAKQ;

the Ro/SSA epitopes: 30, MNRLHRFL, 37, LCFGSEGGT, 38, CFGSEGGT, 44, SEGPTYIIEQ, 45, EGGTYIIEQ, 47, GTYIIEQ, 47, GTYI, 76, EIKSFSQEGRT, 78, KSFSQEGR, 81, SQEGRTTKQ, 84, GRTTKQEP, 105, STKQAAFKAV, 106, ISTKQAAFKAVS, 109, KQAAFKAV, 111, AFKAVSEVC, 126, FTFIQFKKDLKESMK, 130, QFKKDLKE, 138, SMKCGMWGRA, 139, MKCGMWGRA, 142, GMWGRALRKAIA, 145, GRALRKAI, 165, ALAVTKYKORNGWSHKDLLRLSH, 169, TKYKORNG, 173, ORNGWSHK, 182, LLRLSHLKPSS, 184, RLSHLKPSS, 198, TKYITKGW, 201, ITKGWKEV, 210,

HELYKEKA, 212, LYKEKALSV, 215, KALSVETEKLLKYL, 221, TEKLLKYL, 224, KLLKYLEA, 229, LEAVEKVKRTKDE, 234, KVKRTKDE, 257, HLLTNHLKSKEVWKALLQEMPL, 263, LKSKEVWK, 264, KSKEVWKA, 265, SKEVWK, 280, ALLRNLGKMTA, 283, RNLGKMT, 285, LGKMTANS, 308, LCNEKLLKKARIHPFHI, 313, LLKKARI, 315, KKARIHPF, 330, TYKTGHGLRGKLKWRPDE, 331, YKTGHGL, 352, ALDAAFYK, 355, AAFYKTFKTVEPTGKRFLLA, 362, ASMNVRLGS, 365, EPTGKRFL, 398, AMCMVVTR, 414, AFSDEMVP, 420, VPCPVTTD, 433, VLMAMSQI, 445, TDCSLPMI, 449, LPMIWAQKTNTPA, 453, TFAGGVHPAI, 472, TFAGGVHPAI, 472, TFAGGVHP, 482, IALREYRKMDIPAKL, 484, REYRKMD;

Sub 32
the Sm B/B epitopes: 20, IGTFKAFD, 21, GTFKAFDK, 22, TFKAFDKH, 29, GTFKAFDK, 30, TFKAFDKHM, 44, DCDEFRI, 45, CDEFKAIK, 45, CDEFRIKPKNAKQP, 46, DEFRIJKP, 47, EFRKIKPK, 76, FRKJKPKN, 77, RKIKPKNA, 78, KIKPKNAK, 79, IKPKNAKQ, 80, KPKNAKOP, 81, PKNAKQPE, 83, EGPPPKDT, 88, KDTGIARV, 94, RVPLAGAA, 101, AGGPGVGRAAGRGVPAG, 104, PGVGRAAG, 120, IPQAPAGLAG, 125, AGLAGPVRGVGGPSQ, 131, VRGVGGPS, 139, QQVMTPQG, 140, QVMTPQGR, 141, VMTPOGRG, 144, POGR, 142, MTPQGBGT, 143, TPQGRGTV, 144, PQGRGTVA, 145, QGRGTVAA, 164, APTQYPPG, 165, PTQYPPGR, 166, TQYPPGRG, 167, QYPPGRGT, 168, YPPGRGTP, 169, PPGRGTTP, 170, PGRGTTPP, 171, GRGTTPPP, 172, RGTPPPPV, 173, GTPPPPVG, 174, TTPPPVGRATPPPGI, 175, PPPVGRA, 184, PPPGIMAP, 188, IMAPPPGM, 189, MAPPPGMRPPM, 189, MAPPPGMR, 191, PPPGMR, 190, APPPGMRP, 191, PPPGMRPP, 192, PPGMRPPM, 202, PIGLPPARGTPIGMPP, 206, PPARGTPI, 212, PIGMPPPG, 213, IGMPPPGM, 214, GMPPPGMB, 216, PPPGMB, 215, MPPPGMRP, 216, PPPGMRPP, 217, PPGMRPPP, 220, MRPPPPGI, 221, RPPPPGIR, 221, RPPPPGIRGPP, 223, PPPGIR, 222, PPPPGIRG, 223, PPPGIRGP, 224, PPGIRGPP, 228, RGPPPPGM, 228, RGPPPPGMRPPR, 229, GPPPPGMR, 230, PPPPGMRP, 231, PPPGMRPP, 231, PPPGMR, and 232, PPGMRPPR, or mixtures thereof, in an amount effective to block an autoimmune response.

Sub 32
18. The method of claim 17 wherein the epitope acts as a vaccine against an autoimmune disorder.

19. The method of claim 17 wherein the epitope binds to the autoantibodies to block the autoimmune response.

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B2

20. The method of claim 17 wherein the epitopes are administered in combination to block an autoimmune response involving more than one autoantibody.